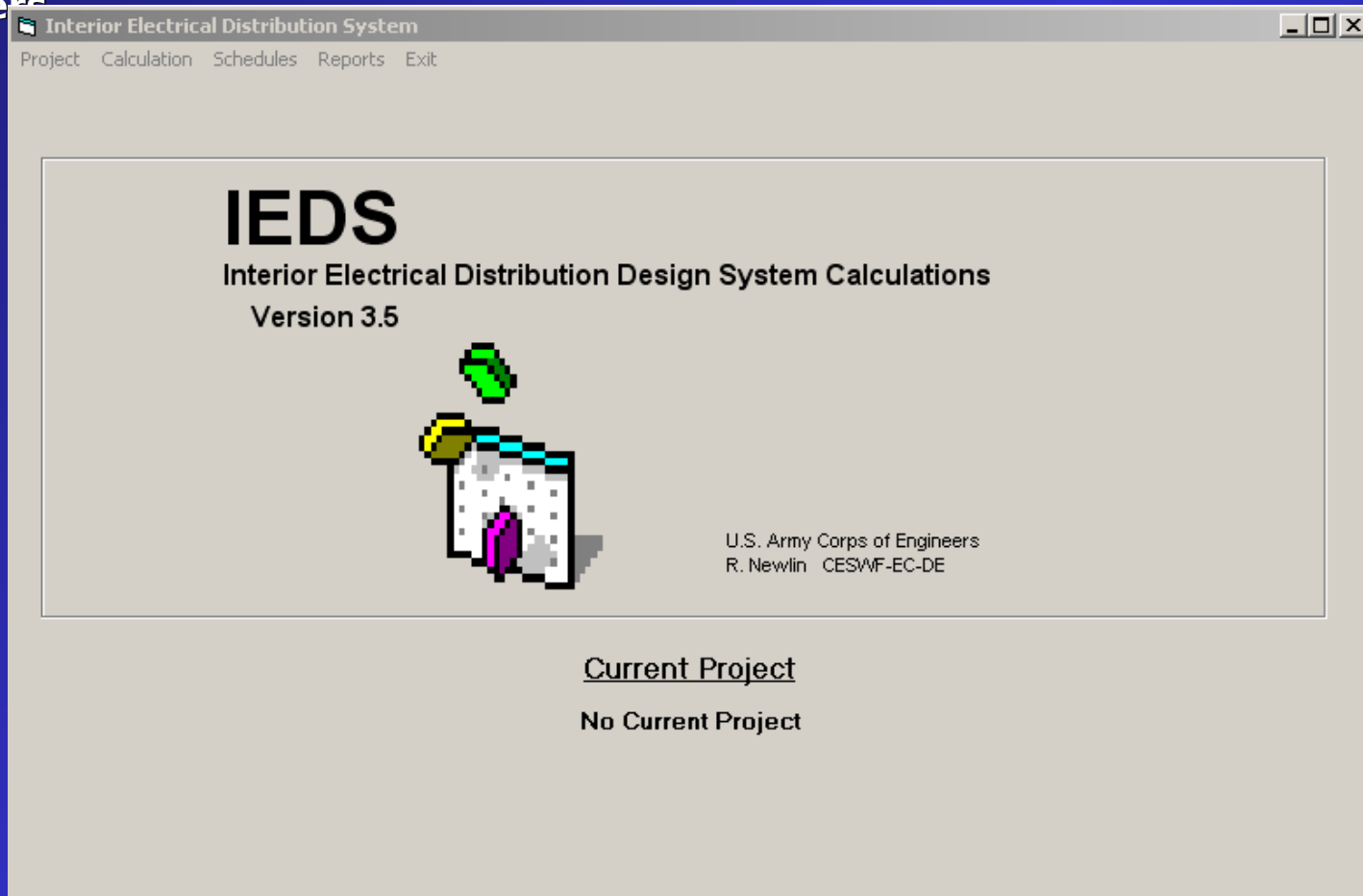




US Army
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Fort Worth District Electrical Section



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IEDS Description

- Utilized to perform load, protective device, and size calculations for panels, switchboards, motor control centers, transformers, motors, distribution feeders, and fault analysis in english and metric units.
- Visual Basic program utilizing Microsoft Access database for project and standard equipment data storage.

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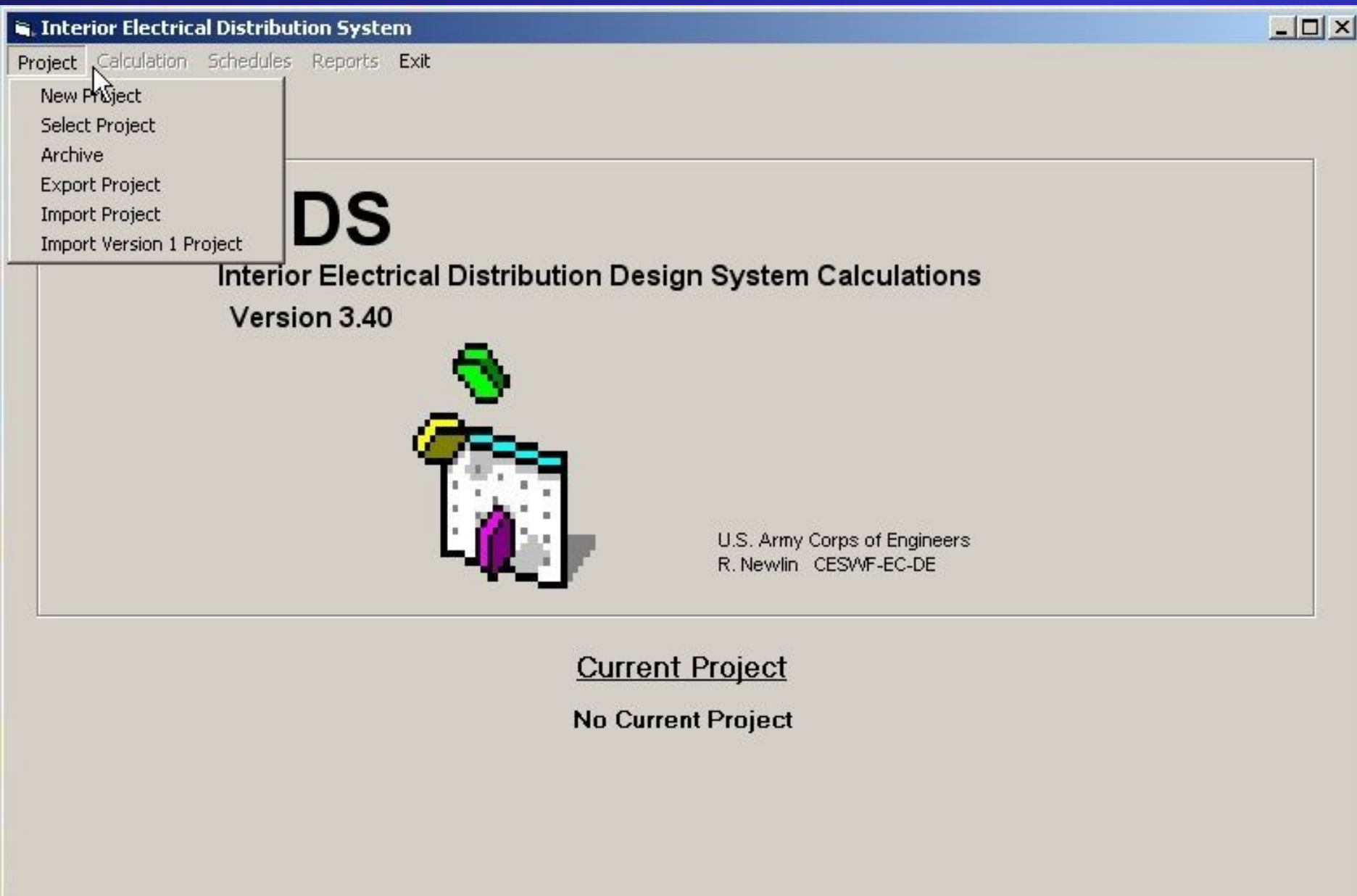


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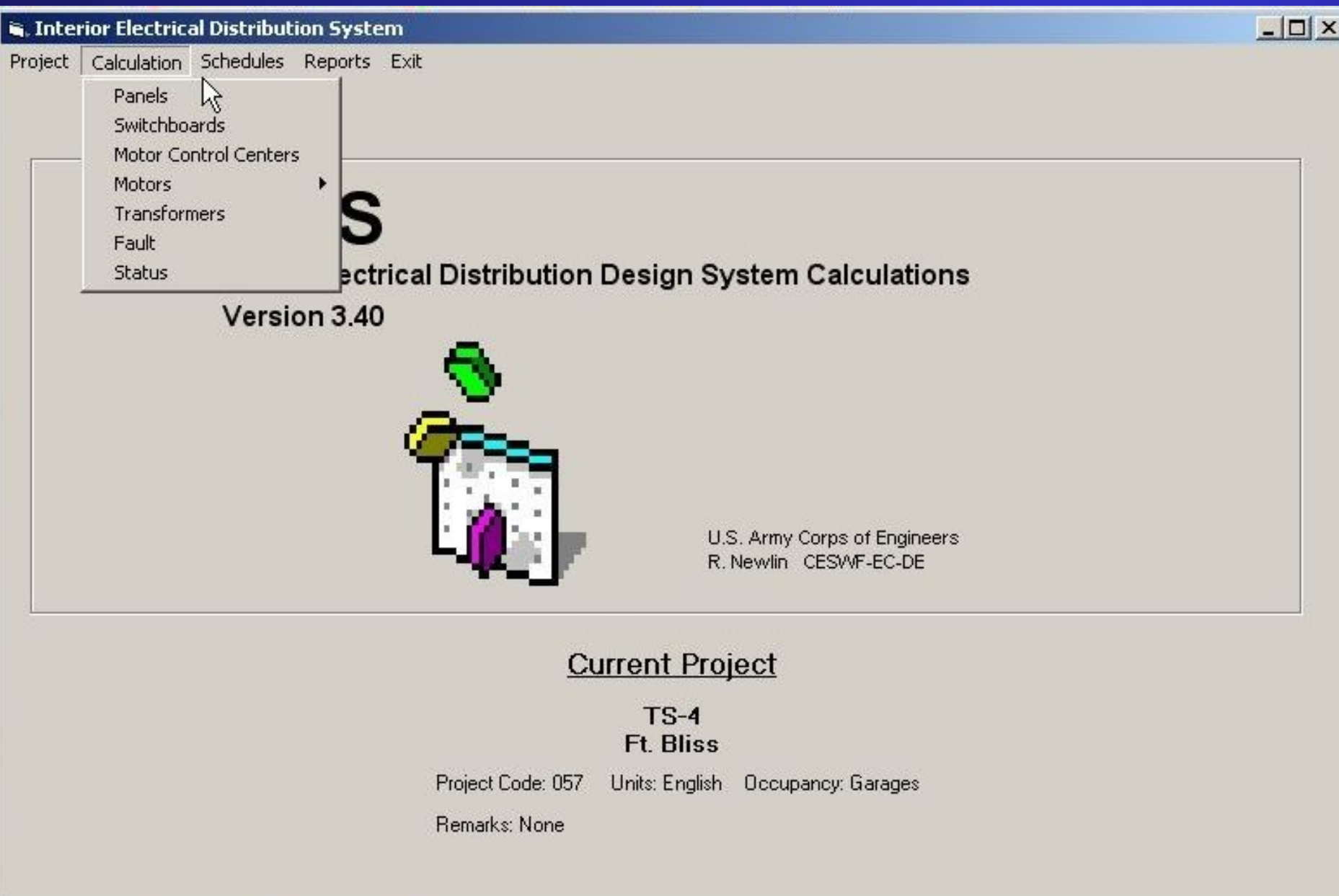
IEDS Output

- Schedules output to Microsoft Excel Spreadsheet which may be linked to Microstation using copy & paste methods.
- Reports output to Microsoft Excel.

Menu-Project



Menu-Calculation



Panel Calculations (Panels)

Panels

Panels

Circuits

Loads

Mains

Feeder

Current Panels								
	Name	Volts	Phase	Wires	Main Amps	Main Type	Source	Date
▶	TB	120/208	3	4	100	Main Lugs Only	TA	6/2/2004
	TC	120/208	3	4	100	Main Lugs Only	TA	6/2/2004
	TD	120/208	3	4	600	Main Lugs Only	TA	6/2/2004
	SB	120/208	3	4	100	Main Lugs Only	SA	6/2/2004
	SA	120/208	3	4	350	Main Circuit Breaker	TA	6/2/2004
	TE	120/208	3	4	225	Main Lugs Only	TA	6/3/2004
	TA	120/208	3	4	1600	Main Circuit Breaker	T	6/4/2004

Add Panel

Copy Panel

Panel Calculations (Circuits)

Panels	Circuits	Loads	Mains	Feeder																																																																																																																																																																																																																
Panel <input type="text" value="SB"/>	PANEL SB 120/208 Volts, 3 Phase, 4 Wire, 100A Main Lugs Only																																																																																																																																																																																																																			
<input type="button" value="Cancel"/> <input type="button" value="Delete Circuit"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CKT</th> <th>BKR</th> <th>P</th> <th>Load Category</th> <th>Load Description</th> <th>PhaseA</th> <th>PhaseB</th> <th>PhaseC</th> </tr> </thead> <tbody> <tr><td>1</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>1560</td><td>0</td><td>0</td></tr> <tr><td>2</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>1225</td><td>0</td><td>0</td></tr> <tr><td>3</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>0</td><td>1200</td><td>0</td></tr> <tr><td>4</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>0</td><td>1050</td><td>0</td></tr> <tr><td>5</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>0</td><td>0</td><td>1156</td></tr> <tr><td>6</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>0</td><td>0</td><td>960</td></tr> <tr><td>7</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>1000</td><td>0</td><td>0</td></tr> <tr><td>8</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>960</td><td>0</td><td>0</td></tr> <tr><td>9</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>0</td><td>1000</td><td>0</td></tr> <tr><td>10</td><td>20</td><td>1</td><td>Lighting</td><td>LIGHTING</td><td>0</td><td>960</td><td>0</td></tr> <tr><td>11</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>0</td><td>0</td><td>1000</td></tr> <tr><td>12</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>0</td><td>0</td><td>1000</td></tr> <tr><td>13</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>1000</td><td>0</td><td>0</td></tr> <tr><td>14</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>1440</td><td>0</td><td>0</td></tr> <tr><td>15</td><td>20</td><td>1</td><td>Spare/Space</td><td>SPARE</td><td>0</td><td>1000</td><td>0</td></tr> <tr><td>16</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>1260</td><td>0</td></tr> <tr><td>17</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>0</td><td>1440</td></tr> <tr><td>18</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>0</td><td>1440</td></tr> <tr><td>19</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>1260</td><td>0</td><td>0</td></tr> <tr><td>20</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>1260</td><td>0</td><td>0</td></tr> <tr><td>21</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>900</td><td>0</td></tr> <tr><td>22</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>1080</td><td>0</td></tr> <tr><td>23</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>0</td><td>500</td></tr> <tr><td>24</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>0</td><td>0</td><td>1080</td></tr> <tr><td>25</td><td>20</td><td>1</td><td>Duplex Receptacles</td><td>DUPLEX RECEPTACLES</td><td>500</td><td>0</td><td>0</td></tr> </tbody> </table>				CKT	BKR	P	Load Category	Load Description	PhaseA	PhaseB	PhaseC	1	20	1	Lighting	LIGHTING	1560	0	0	2	20	1	Lighting	LIGHTING	1225	0	0	3	20	1	Lighting	LIGHTING	0	1200	0	4	20	1	Lighting	LIGHTING	0	1050	0	5	20	1	Lighting	LIGHTING	0	0	1156	6	20	1	Lighting	LIGHTING	0	0	960	7	20	1	Spare/Space	SPARE	1000	0	0	8	20	1	Lighting	LIGHTING	960	0	0	9	20	1	Spare/Space	SPARE	0	1000	0	10	20	1	Lighting	LIGHTING	0	960	0	11	20	1	Spare/Space	SPARE	0	0	1000	12	20	1	Spare/Space	SPARE	0	0	1000	13	20	1	Spare/Space	SPARE	1000	0	0	14	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	1440	0	0	15	20	1	Spare/Space	SPARE	0	1000	0	16	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	1260	0	17	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	0	1440	18	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	0	1440	19	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	1260	0	0	20	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	1260	0	0	21	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	900	0	22	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	1080	0	23	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	0	500	24	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	0	0	1080	25	20	1	Duplex Receptacles	DUPLEX RECEPTACLES	500	0	0
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Panel Calculations (Loads)

Panels	Circuits	Loads	Mains	Feeder																												
<p>Panel: SB</p> <h3 style="text-align: center;">PANEL SB</h3> <p>120/208 Volts, 3 Phase, 4 Wire, 100A Main Lugs Only</p> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> Use NEC for Duplex Receptacle Demand <input checked="" type="radio"/> Yes <input type="radio"/> No </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> Load Calculation Calculate <input type="checkbox"/> Change Dem Fac </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> Phase Loads (VA) <table style="width: 100%; text-align: center;"> <tr> <td>Phase A</td> <td>Phase B</td> <td>Phase C</td> </tr> <tr> <td>12025</td> <td>10610</td> <td>10436</td> </tr> </table> </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> Total Loads (VA) <table style="width: 100%; text-align: center;"> <tr> <td>Connected</td> <td>Demand</td> <td>Dem Amps</td> <td>Spare</td> </tr> <tr> <td>33071</td> <td>30722.2</td> <td>85.3</td> <td>26%</td> </tr> </table> </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> Largest Motor <div style="display: flex; justify-content: space-between;"> None VA </div> </div> <div style="text-align: right;"> Save Load Data </div>					Phase A	Phase B	Phase C	12025	10610	10436	Connected	Demand	Dem Amps	Spare	33071	30722.2	85.3	26%														
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			<div style="margin-bottom: 10px;"> Add New Category </div> <h3 style="text-align: center;"><u>CATEGORY LOADS</u></h3> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Load Category</th> <th style="text-align: center;">Connected VA</th> <th style="text-align: center;">Dem Fac</th> <th style="text-align: center;">Demand VA</th> </tr> </thead> <tbody> <tr> <td>Lighting</td> <td style="text-align: center;">10391</td> <td style="text-align: center;">1</td> <td style="text-align: center;">10391</td> </tr> <tr> <td>Duplex Receptacles</td> <td style="text-align: center;">14680</td> <td style="text-align: center;">0.84</td> <td style="text-align: center;">12331.2</td> </tr> <tr> <td>Motors</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Other</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Spare</td> <td style="text-align: center;">8000</td> <td style="text-align: center;">1</td> <td style="text-align: center;">8000</td> </tr> <tr> <td>SpecRecept</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>		Load Category	Connected VA	Dem Fac	Demand VA	Lighting	10391	1	10391	Duplex Receptacles	14680	0.84	12331.2	Motors	0	1	0	Other	0	1	0	Spare	8000	1	8000	SpecRecept	0	1	0
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Other	0	1	0																													
Spare	8000	1	8000																													
SpecRecept	0	1	0																													
Exit																																

Panel Calculations (Mains)

Panel: SB

PANEL SB

120/208 Volts, 3 Phase, 4 Wire, 100A Main Lugs Only

Mains Type

☒ Main Lugs Only

☐ Main Circuit Breaker

Calculate

Largest Motor

None

A.

Total Design Amps:

92

Mains

100

Save

CATEGORY LOADS

Load Category	Demand Amps	Load Fac	Design Amps
Lighting	28.8	1.25	36
Duplex Receptacles	34.2	1.00	34.2
Motors	0	1.00	0
Other	0	1.00	0
Spare	22.2	1.00	22.2
SpecRecept	0	1.00	0

Exit

Panel Calculations (Feeder)

Panel

Circuits

Loads

Mains

Feeder

Panel: SB

PANEL SB

120/208 Volts, 3 Phase, 4 Wire, 100A Main Lugs Only

Feeder Data

Length

20

Feet

Max. Volt. Drop

2

%

Power Factor

0.9

Feeder Type

Copper conductors in magnetic conduit

Ground Type

None

Equipment

Calculate

Total Amps

Demand: 85

Design: 92

Feeder Selection

Select

Increase Size

Decrease Size

No. Runs

1

Size

#2

Ampacity

95

% Load

89.5

% Volts Drop

0.26

Feeder: 4 #2 IN 1-1/4" C.

Save

CATEGORY LOADS

Load Category	Demand Amps	Load Fac	Design Amps
Lighting	28.8	1.25	36
Duplex Receptacles	34.2	1.00	34.2
Motors	0	1.00	0
Other	0	1.00	0
Spare	22.2	1.00	22.2
SpecRecept	0	1.00	0

O.C. Protection Selection

100

Size Feeder

Exit

Motor Calculation (Add Motor)

Add Motor

Symbol:

Description:

Volts/Phase

☒ 460V/3 Phase
☐ 200V/3 Phase
☐ 115V/1 Phase

Load Quantity

☒ Single Motor
☐ Multiple Motors
☐ Combination Loads

Motor Type

☒ Non-Hermetic
☐ Hermetic

Load Units

☒ HP/KW
☐ VA
☐ Amps

OC Protection Type

☒ Circuit Breaker
☐ Fuse (D.E.)

HP:

FLA VA Str

Feeder

O.C. Protection(Amps)

Transformer Calculation (Distribution)

Transformers

Dry Type **Distribution** Feeder

Transformer

Name: MT Type: Pad Mount Pri. Volts: 12470 Sec. Volts: 277/480

Subfeed

☒ Panel ☐ Switchboard ☐ MCC TA Demand Load (VA): 474528

PANEL TA

120/208 Volts, 3 Phase, 4 Wire, 1600A Main Circuit Breaker

Transformer

KVA: 500 Percent Loaded: 94.9 %

Save Clear

Exit

Fault Calculations

Fault Calculations

Available

☒ MVA X/R:

☐ Sequence Impedance

Line-To-Line KV: Base MVA:

Low Voltage V:

PUR: PUX:

Main Transformer Impedance

☒ Use Default ☐ Enter Impedance Data

%Z: %X: %R:

Fault Calculations

Menu-Schedules

Interior Electrical Distribution System

Project Calculation Schedules Reports Exit

Panel Schedules

Feeders

Dry Type Transformers

Switchboards

IEDS

Interior Electrical Distribution Design System Calculations

Version 3.40



U.S. Army Corps of Engineers
R. Newlin CESWF-EC-DE

Current Project

**TS-4
Ft. Bliss**

Project Code: 057 Units: English Occupancy: Garages

Remarks: None

Schedules (Panel Schedule)

120/208 Volts 3 Phase 4 Wire				PANEL ALD			21100A MINIMUM INTERRUPTING RATING 225A Main Circuit Breaker			
CKT NO.	TRIP AMPS	NO. POLES	LOAD SERVED	PHASE LOAD VA			LOAD SERVED	CKT NO.	TRIP AMPS	NO. POLES
				A	B	C				
1	20	1	GAS FIRED HEATER GFUH-11	864			EXHAUST FAN EF-5	2	20	3
				480						
3	20	1	DUPLEX RECEPTACLES		360		-	4	-	-
					480					
5	20	1	GAS FIRED HEATER GFUH-10			864	-	6	-	-
						480				
7	20	1	GAS FIRED HEATER GFUH-9	864			WELDING HOOD WEF-1	8	20	3
				864						
9	20	1	GAS FIRED HEATER GFUH-7		864		-	10	-	-
					864					
11	20	1	GAS FIRED HEATER GFUH-8			864	-	12	-	-
						864				
13	20	3	VACUUM OVEN DEF-1	684			SHOP BATH FAN CE-1	14	20	1
				322						
15	-	-	-		684		SPARE	16	20	1
					1000					
17	-	-	-			684	SPARE	18	20	1
						1000				
19	20	1	DUPLEX RECEPTACLES	540			PACKAGED HEAT PUMP PTHP-1	20	20	2
				680						
21	20	1	ELEC WATER COOLER		1000		-	22	-	-
					680					
23	20	1	COUNTER RECEPTACLES			1000	DUPLEX RECEPTACLES	24	20	1
						540				
25	225	3	PANEL ALE	1500			PAINTING BOOTH PEF-1	26	20	3
				900						
27	-	-	-		1500		-	28	-	-
					900					
29	-	-	-			1500	-	30	-	-
						900				
31	225	3	PANEL ALF	31360			SPARE	32	20	3
				1500						
33	-	-	-		30100		-	34	-	-
					1500					
35	-	-	-			31060	-	36	-	-
						1500				
37	20	1	SPARE	1000			SPACE ONLY (20A - 1P)	38	-	-
				0						
39	20	1	SPARE		1000		SPACE ONLY (20A - 1P)	40	-	-
					0					
41	20	1	SPARE			1000	SPACE ONLY (20A - 1P)	42	-	-
						0				
TOTAL				39878	39252	40576				
TOTAL CONNECTED LOAD 119.7 KVA				DEMAND AMPS 272.5						
TOTAL DEMAND LOAD 98.2 KVA										

Menu-Reports

Interior Electrical Distribution System

Project Calculation Schedules Reports Exit

Load Summary
Feeders
Motors
Transformers
Fault Calculations

IELDS

Interior Electrical Distribution Design System Calculations
Version 3.40



U.S. Army Corps of Engineers
R. Newlin CESWF-EC-DE

Current Project

TS-4
Ft. Bliss

Project Code: 057 Units: English Occupancy: Garages

Remarks: None



US Army
Corps of
Engineers

Reports - Load Summary

PANEL KC LOAD SUMMARY

<u>LOAD CATEGORY</u>	<u>CONNECTED VA</u>	<u>DEM FAC</u>	<u>DEMAND VA</u>
Other	26340	0.90	23706
Spare	8000	1.00	8000
Kitchen Equipment	24000	0.90	22410

Total Connected Load = 59240 VA

Total Demand Load = 54116 VA

PANEL KD LOAD SUMMARY

<u>LOAD CATEGORY</u>	<u>CONNECTED VA</u>	<u>DEM FAC</u>	<u>DEMAND VA</u>
Lighting	200	1.00	200
Motors	2300	0.90	2070
Other	53225	0.90	47902
Spare	8000	1.00	8000
Kitchen Equipment	2000	0.90	1800

Total Connected Load = 65725 VA

Total Demand Load = 59972 VA

PANEL KF LOAD SUMMARY

<u>LOAD CATEGORY</u>	<u>CONNECTED VA</u>	<u>DEM FAC</u>	<u>DEMAND VA</u>
Other	111250	0.90	100125

Total Connected Load = 111250 VA

Total Demand Load = 100125 VA

*One Corps Serving The Army and the
Nation*



US Army
Corps of
Engineers

Web Sites

- *Fort Worth District Electrical Section:*
 - www.swf.usace.army.mil/pubdata/ed/elect/fwdelec.asp
- *Software:*
 - *Section Info → Software List*
- *IEDS Download:*
 - www.swf.usace.army.mil/pubdata/ed/elect/software/iedsdnld.asp



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Discussion

- Any Questions ?

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